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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,849	07/18/2002	Paul Moeltgen	12707P04US	2233

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EXAMINER	
ANDERSON, MATTHEW A	

ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 09/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/088,849	MOELTGEN ET AL.	
	Examiner	Art Unit	
	Matthew A. Anderson	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sternitzke (Review: Structural Ceramic Nan-composites, Structural Ceramic Composites-composites, P11: So955-2219(96)00222-1, pp. 1061-1082.) in view of Reed (Introduction to the Principles of Ceramic Processing, John Wiley and Sons, New York New York, pp. 463-464, 1988.).

Sternitzke discloses the methods of forming nano-composites including Al_2O_3/SiC systems. (abstract) Sol-gel processing is suggested in the abstract. Item 2 on page 1062-1068 details Al_2O_3/SiC nano-composites. In 2.1.3 sol-gel processing is suggested as a method making the Al_2O_3/SiC nano-composites. Boehmite (a.k.a. α-

alumina to those of ordinary skill in the art) is suggested in 2.1.3 as a starting material to make a gel to coat the SiC de-agglomerated particles. The pH is adjusted. This is dried and calcined. Then hot-pressed at 1600'C. Inert sintering is disclosed in Table 2.

Sternitzke does not suggest adding sinter additives to the sol.

Reed discloses common method of processing ceramics such as Al_2O_3. On page 463, Reed suggests adding a small amount of a wetting liquid (i.e. a sinter additive) to alumina during sintering to improve density and lower the temperature required for sintering. Abrasive media was one suggested use. The additive also prevents abnormal grain growth.

It would have been obvious to one of ordinary skill in the art at the time of the present invention to combine the references of Sternitzke and Reed because Reed discloses a method of improving density and reducing the temperature of sintering for abrasive media and Sternitzke discloses a process of making a composite based on alumina. Motivation to combine would be the expectation that denser nano-composite would be obtained at a lower sintering temperature.

In respect to claims 1-2, 4-6, 9 it would have been obvious to one of ordinary skill in the art at the time of the present invention to produce a Al_2O_3/SiC nano-composite by the sol-gel method as per Sternitzke using a Boehmite precursor and fine SiC with sintering additives added and pH adjustment which is sintered under inert conditions because such a method would produce a Al_2O_3/SiC nano-composite with an improved density and at a reduced the sintering temperature.

In respect to claims 3, 12, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the mol. % of the SiC because although Sternitzke discloses vol% of SiC in the alumina matrix from 0% to 30% (see Fig. 5), vol% and mol.% are mathematically related as well known in the art.

In respect to claims 7 and 8, it would have been obvious to one of ordinary skill in the art at the time of the present invention to optimize the temperature of the drying, calcinations, and sintering because although Sternitzke does not specifically specify the temperatures, one of ordinary skill in the art would do so with only routine experimentation. Reed suggests that the sintering temperature can be lowered. Motivation for using a lower temperature would be cost savings for fuel and less wear on heating systems.

In respect to claims 10, it would have been obvious to one of ordinary skill in the art at the time of the present invention to use Al_2O_3/SiC nano-composite comminuted from sintered Al_2O_3/SiC nano-composite because Sternitzke suggests on page 1079 the use of such Al_2O_3/SiC nano-composites as an abrasive grit and basic skill in the art allows comminution of ceramics to fine powder.

In respect to claims 11, 13-19, it would have been obvious to one of ordinary skill in the art at the time of the present invention to conclude, without evidence to the contrary, that the Al_2O_3/SiC nano-composite of Sternitzke would have the claimed physical properties because one of ordinary skill would expect like materials to act in a like manner when formed by a like process.

In respect to claim 20, it would have been obvious to one of ordinary skill in the art at the time of the present invention to use an abrasive powder with grinding belts or wheels since this is common to anyone of ordinary skill in the art.

Response to Arguments

3. Applicant's arguments filed 7/19/2004 have been fully considered but they are not persuasive.

4. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., elimination of hot pressing) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claim 1 does not in any way limit the process to one where no hot pressing (i.e. sintering with external pressure applied) occurs to densify the ceramic composite. The teaching away argument is thus moot since the claims do not contain the limitation from which the reference "teaches away".

5. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The argument that the sinter additives taught by Reed are not appropriate is not

convincing. The applicant themselves require sinter additives to be added to the mixture and Reed discloses that such methods were common place in the prior art to enhance sintering.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Anderson whose telephone number is (571) 272-1459. The examiner can normally be reached on M-Th, 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAA
September 23, 2004

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER